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PATENT APPLICATION

ATTORNEY DOCKET NO. 200314345-1

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): WOZNIAK

Confirmation No.: 1952

Application No.: 10/729,501

Examiner: Boateng, Alexis Asiedua

Filing Date: December 5, 2003

Group Art Unit: 2838

Title: BATTERY PACK WITH PROTECTION CIRCUIT

Mail Stop Appeal Brief-Patents
Commissioner For Patents
PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on April 7, 2006.

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) \$500.00.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

☐ (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d)) for the total number of months checked below:

☐ 1st Month
\$120

☐ 2nd Month
\$450

☐ 3rd Month
\$1020

☐ 4th Month
\$1590

☐ The extension fee has already been filed in this application.

☒ (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account 08-2025 the sum of \$ 500. At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees. A duplicate copy of this sheet is enclosed.

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Respectfully submitted,

WOZNIAK

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ZWAF



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

**APPEAL FROM THE EXAMINER TO THE BOARD
OF PATENT APPEALS AND INTERFERENCES**

Applicants: John A. WOZNIAK Confirmation No.: 1952
Application Serial No.: 10/729,501
Filed: December 5, 2003
Title: BATTERY PACK WITH PROTECTION CIRCUIT

Group Art Unit: 2838
Examiner: Boateng, Alexis Asiedua

Docket No.: 200314345-1

MAIL STOP: APPEAL BRIEF PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

APPEAL BRIEF

Applicant has appealed to the Board of Patent Appeals and Interferences from the decision of the Examiner mailed February 8, 2006, finally rejecting Claims 1-38. Applicant filed a Notice of Appeal on April 7, 2006. Applicant respectfully submits herewith this Appeal Brief with authorization to charge the statutory fee of \$500.00.

06/14/2006 TBESHAH1 00000017 002025 10729501
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REAL PARTY IN INTEREST

The present application was assigned to Hewlett-Packard Development Company, L.P. as indicated by an assignment from the inventor recorded on December 5, 2003 in the Assignment Records of the United States Patent and Trademark Office at Reel 014773, Frame 0001. The real party in interest is Hewlett-Packard Development Company, LP, a limited partnership established under the laws of the State of Texas and having a principal place of business at 20555 S.H. 249 Houston, TX 77070, U.S.A. (hereinafter "HPDC"). HPDC is a Texas limited partnership and is a wholly-owned affiliate of Hewlett-Packard Company, a Delaware Corporation, headquartered in Palo Alto, CA. The general or managing partner of HPDC is HPQ Holdings, LLC.

RELATED APPEALS AND INTERFERENCES

There are no known appeals or interferences that will directly affect or be directly affected by or have a bearing on the Board's decision in this pending appeal.

STATUS OF CLAIMS

Claims 1-38 stand rejected pursuant to a Final Office Action mailed February 8, 2006. Claims 1-38 are presented for appeal.

STATUS OF AMENDMENTS

No amendment has been filed subsequent to the mailing of the Final Office Action.

SUMMARY OF CLAIMED SUBJECT MATTER

Embodiments of the present invention as defined by independent Claim 1 are directed toward a battery pack (12) comprising a protection circuit (12) adapted to detect an excessive current consumption condition associated with electronic components (14) forming the battery pack (12) (at least at paragraphs 0009-0017, and the figure).

Embodiments of the present invention as defined by independent Claim 10 are directed toward a battery pack (10) comprising at least one battery cell means (18) coupled to electronic components (14) forming the battery pack (10) and means (12) for detecting an excessive current consumption condition associated with the electronic components (14) (at least at paragraphs 0009-0017, and the figure).

Embodiments of the present invention as defined by independent Claim 15 are directed toward a battery pack (10) comprising a battery core pack (18) coupled to electronic components (14) forming the battery pack (10) and an integrated circuit (30, 32) adapted to compare potentials across at least two different current sensors (38, 40, 68, 70) to detect an excessive current consumption condition associated with the electronic components (14) (at least at paragraphs 0009-0017, and the figure).

Embodiments of the present invention as defined by independent Claim 30 are directed toward a battery pack (10) comprising a battery core pack (18) connected to a positive terminal (20) of the battery pack (10) and a negative terminal (22) of the battery pack (10), the positive and negative terminals (20, 22) adapted to be connected to a host device (24), and a protection circuit (12) adapted to distinguish between current consumption associated with electronic components (14) coupled to the battery core pack (18) and forming the battery pack (10) and current flow associated with the host device (24) to determine whether an excessive current consumption condition exists associated with the electronic components (14) of the battery pack (10) (at least at paragraphs 0009-0017, and the figure).

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

1. Claim 1 was rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,060,185 issued to Okutoh (hereinafter “Okutoh”).
2. Claims 10, 11, 13, 14, 30 and 31 were rejected under 35 U.S.C. § 102(a) as being anticipated by U.S. Patent No. 6,501,248 issued to Fujiwara (hereinafter “Fujiwara”).

3. Claim 15 was rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,534,953 issued to Shirakawa (hereinafter "*Shirakawa*").

4. Claims 2, 4, 5 and 9 were rejected under 35 U.S.C. 103(a) as being unpatentable over *Okutoh* in view of *Fujiwara*.

5. Claim 3 was rejected under 35 U.S.C. §103(a) as being unpatentable over *Okutoh* in view of *Shirakawa*.

6. Claims 6 and 7 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Okutoh* in view of U.S. Patent No. 5,963,019 issued to Cheon (hereinafter "*Cheon*").

7. Claim 8 was rejected under 35 U.S.C. §103(a) as being unpatentable over *Okutoh* in view of U.S. Publication No. 2004/0062387 issued to O'Connor (hereinafter "*O'Connor*").

8. Claim 12 was rejected under 35 U.S.C. §103(a) as being unpatentable over *Fujiwara* in view of *Shirakawa*.

9. Claims 16, 24 and 25 was rejected under 35 U.S.C. §103(a) a being unpatentable over *Shirakawa* in view of *Fujiwara*.

10. Claim 17 and 18 was rejected under 35 U.S.C. § 103(a) as being unpatentable over *Shirakawa* in view of U.S. Patent No. 6,046,575 issued to Demuro (hereinafter "*Demuro*").

11. Claim 19, 20, 22, 33 and 38 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Shirakwawa* and *Fujiwara* in view of U.S. Patent Publication No. 2003/0080747 issued to Huelss (hereinafter "*Huelss*").

12. Claims 21, 23 and 34 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Shirakwawa* and *Fujiwara* in view of U.S. Publication No. 2003/0117143 issued to Okada (hereinafter "*Okada*").

13. Claims 26, 28, 29, 35 and 37 was rejected under 35 U.S.C. §103(a) as being unpatentable over *Shirakawa* and *Fujiwara* in view of *Cheon*.

14. Claims 27 and 36 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Shirakwawa* and *Fujiwara* in view of U.S. Patent No. 6,492,791 issued to Saeki (hereinafter "*Saeki*").

15. Claim 32 was rejected under 35 U.S.C. §103(a) as being unpatentable over *Fujiwara* in view of *Shirakawa*.

ARGUMENT

A. Standard

1. 35 U.S.C. § 102

Under 35 U.S.C. § 102, a claim is anticipated only if each and every element as set forth in the claim is found in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051 (Fed. Cir. 1987); M.P.E.P. § 2131. In addition, “[t]he identical invention must be shown in as complete detail as is contained in the . . . claims” and “[t]he elements must be arranged as required by the claim.” *Richardson v. Suzuki Motor Co.*, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989); *In re Bond*, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990); M.P.E.P. § 2131.

2. 35 U.S.C. § 103

To establish a *prima facie* case of obviousness under 35 U.S.C. § 103, three basic criteria must be met: First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings; second, there must be a reasonable expectation of success; and finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *In re Vaeck*, 947 F.2d 488, (Fed. Cir. 1991); M.P.E.P. § 2143. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant’s disclosure. *Id.* Further, the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680 (Fed. Cir. 1990); M.P.E.P. § 2143.01. Additionally, not only must there be a suggestion to combine the functional or operational aspects of the combined references, but also the prior art is required to suggest both the combination of elements and the structure resulting from the combination. *Stiftung v. Renishaw PLC*, 945 F.2d 1173, 1183 (Fed.

Cir. 1991). Moreover, where there is no apparent disadvantage present in a particular prior art reference, then generally there can be no motivation to combine the teaching of another reference with the particular prior art reference. *Winner Int'l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 (Fed. Cir. 2000).

B. Argument

1. First Ground of Rejection (Claim 1)

Claim 1 was rejected under 35 U.S.C. § 102(b) as being anticipated by *Okutoh*. Applicant respectfully submits that *Okutoh* does not disclose or even suggest each and every limitation of independent Claim 1.

Embodiments of the present invention are directed toward a battery pack (10) with a protection circuit (12) for determining current consumption by electronic components forming the battery pack (10) (at least at paragraphs 0009-0017, and the figure). For example, in some embodiments of the present invention, the battery pack (10) comprises a battery core pack (18) comprising a plurality of battery cells (B1-B4) and various types of electronic components (14) forming the battery pack coupled to the battery cells (B1-B4) (e.g., resistors, capacitors, transistors, fuses, and other integrated circuit components) (at least at paragraphs 0009-0017, and the figure). In some embodiments of the present invention, the protection circuit (12) is configured to determine and/or monitor (a) the amount of current flowing in and/or out of the battery pack (10) (e.g., associated with a host device (24) coupled to the battery pack (10) such as a recharging device or a device being powered by the battery pack (10)) and (b) the current flow associated with electronic components (14) forming the battery pack (10) by measuring the voltage drop across a current sensor (38) (e.g., coupled to a negative terminal (22) of the host device (24)) (at least at paragraphs 0011, 0012, 0016, and the figure)). The protection circuit (12) is also configured to measure and/or monitor the amount of current flowing to and/or from of the host device (24) via a current sensor (68) (e.g., coupled to a positive terminal (20) of the host device (24)) (at least at paragraphs 0011, 0012, 0016 and the figure). Thus, in embodiments of the present invention, the

voltage drop across current sensor (68) represents a combined current flow corresponding to current flow (a) associated with a host device (24) and (b) the current flow associated with components (14) forming the battery pack (10) such that, by comparing the combined current flow (e.g., based on the voltage drop across current sensor (68)) with the current flow corresponding only to the host device (24) (e.g., based on the voltage drop across current sensor (38)), the current flow associated solely with components (14) forming the battery pack (10) is obtained (at least at paragraph 0017 and the figure). In some embodiments of the present invention, if the current consumption associated with components (14) forming the battery pack (10) exceeds a predetermined threshold, the current flow may be interrupted (at least at paragraph 0017). Accordingly, for example, independent Claim 1 recites “a protection circuit adapted to detect an excessive current consumption condition associated with electronic components forming the battery pack” (emphasis added).

Applicant respectfully submits that *Okutoh* does not disclose or even suggest each and every limitation of independent Claim 1. In the Final Office Action, the Examiner’s basis for rejecting Claim 1 is “Figure 1 item 13” of *Okutoh* (Final Office Action, page 2). *Okutoh* appears to disclose that reference numeral 13 is directed toward an overcurrent protecting circuit (*Okutoh*, column 3, lines 39-40, figure 1). *Okutoh* recites:

As an excessive current passes through the load, there is a voltage drop across discharging and charging switches 7 and 8 due to their on-resistance. As the voltage drop reaches a voltage preset by the overcurrent-protecting circuit, the discharging switch 7 is put off via the switch driver circuit 5, so that the discharge of the battery is finished.

(*Okutoh*, column 3, lines 40-46) (emphasis added). Applicant respectfully submits that *Okutoh* appears to be directed toward detecting an overcurrent condition on a load external to the battery of *Okutoh*. Instead, Applicant’s independent Claim 1 recites a protection circuit adapted to detect an “excessive current consumption condition” by the “electronic components forming the battery pack” (emphasis added). Further,

Okutoh appears to be directed toward detecting the current “passing through” a load (e.g., a device attached to the battery pack of *Okutoh* (*Okutoh*, column 3, lines 40-46)), instead of detecting an “excessive current consumption condition” by the “electronic components forming the battery pack” as recited by Claim 1 (emphasis added). Accordingly, Applicant respectfully submits that *Okutoh* does not disclose or even suggest a protection circuit for detecting an excessive current consumption condition associated with electronic components forming the battery pack as recited by independent Claim 1. Thus, for at least these reasons, Applicant respectfully submits that *Okutoh* does not anticipate independent Claim 1.

The Examiner also states that *Okutoh* discloses that “current is detected within the batteries and shut off when it reaches a certain value” and that “the charge passed through all of the electronic components, which form the battery pack, therefore the charge of the battery components are detected” (Final Office Action, pages 11 and 12). Applicant respectfully submits that even though current may be detected within the battery of *Okutoh*, the detected current is associated with a load external to the battery and not associated with the components forming the battery pack of *Okutoh*. Further, without addressing the accuracy of the Examiner’s statement that a charge is passed through “all” of the electronic components of the *Okutoh* battery pack, the passing of a charge or current through the battery pack of *Okutoh* does not necessarily result in determining a current consumption condition associated with components forming the battery pack of *Okutoh* (e.g., the current consumed by integrated circuits, resistors, capacitors, etc., of the *Okutoh* battery pack), which *Okutoh* clearly does not determine. Thus, for at least these reasons also, Applicant respectfully submits that *Okutoh* does not anticipate independent Claim 1.

Accordingly, for at least the reasons discussed above, independent Claim 1 is clearly patentable over the *Okutoh* reference.

2. Second Ground of Rejection (Claims 10, 11, 13 and 14)

Claims 10, 11, 13 and 14 were rejected under 35 U.S.C. § 102(a) as being anticipated by *Fujiwara*. Of the rejected claims, Claim 10 is independent. Applicant respectfully submits that independent Claim 10 is patentable over the *Fujiwara* reference and, therefore, Claims 11, 13 and 14 that depend therefrom are also patentable.

In the Final Office Action, the Examiner refers to “column 3 lines 48-56” of *Fujiwara* as disclosing the limitations of independent Claim 10 (Final Office Action page 2). Applicant respectfully disagrees. *Fujiwara* appears to disclose a discharge-state overcurrent detector and a charge-state overcurrent detector for a battery 30 of the battery pack of *Fujiwara* (*Fujiwara*, column 3, lines 48-56, column 5, lines 39-52, column 6, lines 26-39). *Fujiwara* recites:

The discharge-[state] overcurrent detector 13 detects a discharge-state overcurrent condition of the battery 30 when the battery pack 1 is set in the discharge state. . . . The charge-state overcurrent detector 21 detects a charge-state overcurrent condition of the battery 30 when the battery pack 1 is set in the charge state.

(*Fujiwara*, column 6, lines 26-39) (emphasis added). Thus, the portion of *Fujiwara* referred to by the Examiner appears to be directed toward a current condition of the battery 30 of the battery pack 1 of *Fujiwara* and not a current condition of components of the battery pack 1 of *Fujiwara* that are coupled to the battery 30 of *Fujiwara*. Independent Claim 10 is directed toward detecting an excess current consumption condition by electronic components of the battery pack that are coupled to the battery. For example, independent Claim 10 recites “at least one battery cell means coupled to electronic components forming the battery pack” and “means for detecting an excessive current consumption condition associated with the electronic components” (emphasis added). Additionally, the Examiner appears to cite the battery 30 of *Fujiwara* as corresponding to both the “battery cell means” and to the “electronic components [of the battery pack coupled to the battery cell means]” recited by Claim 10, which is an improper claim construction. Therefore, Applicant respectfully submits that *Fujiwara*

does not disclose or even suggest, either in the portion of *Fujiwara* referred to by the Examiner or elsewhere on *Fujiwara*, the limitations of independent Claim 10. Accordingly, for at least these reasons, Applicant respectfully submits that *Fujiwara* does not anticipate independent Claim 10.

The Examiner also states that *Fujiwara* discloses that “excessive current is detected when it occurs in the battery pack” and that “the [*Fujiwara*] system detects the current consumption in the battery pack and the electronic components coupled to the battery pack” (Final Office Action, page 12). Applicant respectfully submits that even though current may be detected within the battery pack of *Fujiwara*, the detected current is associated with a load external to the battery and not the components forming the battery pack of *Fujiwara* (e.g., the current consumed by integrated circuits, resistors, capacitors, etc., of the *Fujiwara* batterypack), which *Fujiwara* clearly does not determine. Thus, for at least these reasons also, Applicant respectfully submits that *Fujiwara* does not anticipate independent Claim 10.

Accordingly, for at least the reasons discussed above, independent Claim 10 is clearly patentable over the *Fujiwara* reference and, therefore, Claims 11, 13 and 14 that depend therefrom are also allowable.

3. Second Ground of Rejection (Claims 30 and 31)

Claims 30 and 31 were rejected under 35 U.S.C. § 102(a) as being anticipated by *Fujiwara*. Of the rejected claims, Claim 30 is independent. Applicant respectfully submits that independent Claim 30 is patentable over the *Fujiwara* reference and, therefore, Claim 31 that depends therefrom is also patentable.

In the Final Office Action, the Examiner refers to “column 3 lines 48-56” of *Fujiwara* as disclosing the limitations of independent Claim 30 (Final Office Action page 2). Applicant respectfully disagrees. As discussed above in connection with independent Claim 10, *Fujiwara* appears to disclose a discharge-state overcurrent detector and a

charge-state overcurrent detector for a battery 30 of the battery pack 1 of *Fujiwara* (*Fujiwara*, column 3, lines 48-56, column 5, lines 39-52, column 6, lines 26-39). In contrast, independent Claim 30 is directed toward detecting an excess current consumption condition by electronic components of the battery pack that are coupled to the battery. For example, independent Claim 30 recites “a battery core pack” and “a protection circuit adapted to distinguish between current consumption associated with electronic components coupled to the battery core pack and forming the battery pack and current flow associated with the host device to determine whether an excessive current consumption condition exists associated with the electronic components of the battery pack” (emphasis added). Thus, the portion of *Fujiwara* referred to by the Examiner appears to be directed toward a current condition of the battery 30 of the battery pack 1 of *Fujiwara* and not a current condition of components of the battery pack 1 of *Fujiwara* that are coupled to the battery 30 of *Fujiwara*. Once again, the Examiner appears to cite the battery 30 of *Fujiwara* as corresponding to both the “battery core pack” and to the “electronic components coupled to the battery core pack” recited by Claim 30, which is an improper claim construction. Therefore, Applicant respectfully submits that *Fujiwara* does not disclose or even suggest, either in the portion of *Fujiwara* referred to by the Examiner or elsewhere on *Fujiwara*, the limitations of independent Claim 30. Accordingly, for at least these reasons, Applicant respectfully submits that *Fujiwara* does not anticipate independent Claim 30.

The Examiner also states that *Fujiwara* discloses that “excessive current is detected when it occurs in the battery pack” and that “the [*Fujiwara*] system detects the current consumption in the battery pack and the electronic components coupled to the battery pack” (Final Office Action, page 12). Applicant respectfully submits that even though current may be detected within the battery pack of *Fujiwara*, the detected current is associated with a load external to the battery and not the components forming the battery pack of *Fujiwara* (e.g., the current consumed by integrated circuits, resistors, capacitors, etc., of the *Fujiwara* battery pack), which *Fujiwara* clearly does not

determine. Thus, for at least these reasons also, Applicant respectfully submits that *Fujiwara* does not anticipate independent Claim 30.

Accordingly, for at least the reasons discussed above, independent Claim 30 is clearly patentable over the *Fujiwara* reference and, therefore, Claim 31 that depends therefrom is also allowable.

4. Third Ground of Rejection (Claim 15)

Claim 15 was rejected under 35 U.S.C. § 102(b) as being anticipated by *Shirakawa*. Applicant respectfully submits that *Shirakawa* does not disclose or even suggest each and every limitation of independent Claim 15.

In the Final Office Action, the Examiner generally refers to “figure 2 items 74 and 75” of *Shirakawa* as disclosing the limitations of independent Claim 15 (Final Office Action, page 4). Applicant respectfully disagrees. *Shirakawa* appears to disclose sensing resistors R74 and R75 for sensing and controlling the charge current for charging the battery 60 of *Shirakawa* (*Shirakawa*, column 5, lines 11-25). *Shirakawa* recites:

The current sensing resistors R74 and R75 are switched by the switching operation of transistors 76 and 77 . . . that are controlled by the control circuit 73. This controls the amount of charge current.

(*Shirakawa*, column 5, lines 22-25). Thus, the portion of *Shirakawa* referred to by the Examiner appears to be directed toward a current condition of the battery cell 60 of the battery pack of *Shirakawa* and not the current consumption of electronic components forming the battery pack and coupled to the battery 60 of *Shirakawa*. Independent Claim 15 is directed toward detecting an excess current consumption condition by electronic components of the battery pack that are coupled to the battery. For example, independent Claim 15 recites “a battery core pack coupled to electronic components forming the battery pack” and “an integrated circuit adapted to compare potentials across at least two different current sensors to detect an excessive current consumption condition associated

with the electronic components” (emphasis added). Thus, the portion of *Shirakawa* referred to by the Examiner appears to be directed toward a current condition of the battery 60 of the battery pack of *Shirakawa* and not a current condition of components of the battery pack of *Shirakawa* that are coupled to the battery 60 of *Shirakawa*. Again, the Examiner appears to cite the battery 60 of *Shirakawa* as corresponding to both the “battery core pack” and to the “electronic components [coupled to the battery core pack]” recited by Claim 15, which is an improper claim construction. Therefore, Applicant respectfully submits that *Shirakawa* does not disclose or even suggest, either in the portion of *Shirakawa* referred to by the Examiner or elsewhere on *Shirakawa*, the limitations of independent Claim 15. Accordingly, for at least these reasons, Applicant respectfully submits that *Shirakawa* does not anticipate independent Claim 15.

The Examiner also states that *Shirakawa* discloses that the “sensors [of *Shirakawa*] control the charge current within the system, which comprises the electronic components of the battery pack” (Final Office Action, pages 12 and 13). Applicant respectfully submits that even though current may be detected or controlled within the battery pack of *Shirakawa*, the charge current in *Shirakawa* is associated with the battery of the *Shirakawa* battery pack and not the components forming the battery pack of *Shirakawa* (e.g., the current consumed by integrated circuits, resistors, capacitors, etc., of the *Fujiwara* batterypack), which *Fujiwara* clearly does not determine. Further, even though the charging current in *Shirakawa* may pass through particular components of the battery pack of *Shirakawa*, *Shirakawa* does not determine the “current consumption” of any components coupled to the battery of the *Shirakawa* battery pack. Thus, for at least these reasons also, Applicant respectfully submits that *Shirakawa* does not anticipate independent Claim 15.

Further, Claim 15 recites “compar[ing] potentials across at least two different current sensors to detect an excessive current consumption condition associated with the electronic components.” In the Final Office Action, the Examiner refers generally to items 74 and 75 of *Shirakawa* (Final Office Action, pages 3 and 4 (referring to lines 58-

62 of an unidentified column of *Shirakawa*)). Presumably, the Examiner is referring to the current sensing resistors R74 and R75 of *Shirakawa* (*Shirakawa*, col. 5, lines 16-25). However, *Shirakawa* does not appear to disclose, nor did the Examiner explicitly identify any disclosure in the *Shirakawa* reference, that the potentials across the current sensing resistors R74 and R75 of *Shirakawa* are compared, much less compared to detect an excessive current consumption condition associated with the electronic components forming the battery pack. Therefore, for at least this reason also, Applicant respectfully submits that Claim 15 is not anticipated by *Shirakawa*.

Accordingly, for at least the reasons discussed above, independent Claim 15 is clearly patentable over the *Shirakawa* reference.

5. Fourth Ground of Rejection (Claims 2, 4, 5 and 9)

Claims 2, 4, 5 and 9 were rejected under 35 U.S.C. 103(a) as being unpatentable over *Okutoh* in view of *Fujiwara*. Claims 2, 4 and 9 depend from independent Claim 1. For at least the reasons discussed above, independent Claim 1 is patentable over the *Okutoh* reference. For example, *Okutoh* does not disclose or even suggest “a protection circuit adapted to detect an excessive current consumption condition associated with electronic components forming the battery pack” as recited by Claim 1 (emphasis added). Moreover, the Examiner did not rely on *Fujiwara* to remedy at least the deficiencies of *Okutoh* discussed above. Therefore, for at least these reasons, Applicant respectfully submits that Claims 2, 4, 5 and 9 are patentable over the cited references.

6. Fifth Ground of Rejection (Claim 3)

Claim 3 was rejected under 35 U.S.C. §103(a) as being unpatentable over *Okutoh* in view of *Shirakawa*. Claim 3 depends from independent Claim 1. For at least the reasons discussed above, independent Claim 1 is patentable over the *Okutoh* reference. For example, *Okutoh* does not disclose or even suggest “a protection circuit adapted to detect an excessive current consumption condition associated with electronic components forming the battery pack” as recited by Claim 1 (emphasis added). Moreover, the

Examiner did not rely on *Shirakawa* to remedy at least the deficiencies of *Okutoh* discussed above. Therefore, for at least these reasons, Applicant respectfully submits that Claim 3 is patentable over the cited references.

7. Sixth Ground of Rejection (Claims 6 and 7)

Claims 6 and 7 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Okutoh* in view of *Cheon*. Claims 6 and 7 depend from independent Claim 1. For at least the reasons discussed above, independent Claim 1 is patentable over the *Okutoh* reference. For example, *Okutoh* does not disclose or even suggest “a protection circuit adapted to detect an excessive current consumption condition associated with electronic components forming the battery pack” as recited by Claim 1 (emphasis added). Moreover, the Examiner did not rely on *Cheon* to remedy at least the deficiencies of *Okutoh* discussed above. Therefore, for at least these reasons, Applicant respectfully submits that Claims 6 and 7 are patentable over the cited references.

8. Seventh Ground of Rejection (Claim 8)

Claim 8 was rejected under 35 U.S.C. §103(a) as being unpatentable over *Okutoh* in view of *O'Connor*. Claim 8 depends from independent Claim 1. For at least the reasons discussed above, independent Claim 1 is patentable over the *Okutoh* reference. For example, *Okutoh* does not disclose or even suggest “a protection circuit adapted to detect an excessive current consumption condition associated with electronic components forming the battery pack” as recited by Claim 1 (emphasis added). Moreover, the Examiner did not rely on *O'Connor* to remedy at least the deficiencies of *Okutoh* discussed above. Therefore, for at least these reasons, Applicant respectfully submits that Claim 8 is patentable over the cited references.

9. Eighth Ground of Rejection (Claim 12)

Claim 12 was rejected under 35 U.S.C. §103(a) as being unpatentable over *Fujiwara* in view of *Shirakawa*. Claim 12 depends from independent Claim 10. For at least the reasons discussed above, independent Claim 10 is patentable over the *Fujiwara*

reference. For example, *Fujiwara* does not disclose or even suggest “at least one battery cell means coupled to electronic components forming the battery pack” and “means for detecting an excessive current consumption condition associated with the electronic components” as recited by Claim 10 (emphasis added). Moreover, *Shirakawa* does not appear to remedy, nor did the Examiner rely on *Shirakawa* to remedy, at least the deficiencies of *Fujiwara* discussed above. Therefore, for at least these reasons, Applicant respectfully submits that Claim 12 is patentable over the cited references.

Additionally, in the Final Office Action, the Examiner acknowledges that *Fujiwara* does not disclose “means for comparing a voltage potential across at least two different current sensors to detect the excessive current condition” (Final Office Action, page 6). However, the Examiner further asserts that *Shirakawa* discloses the above-referenced limitation of Claim 12, and that it would have been obvious to one of ordinary skill to apparently modify the *Fujiwara* circuit with the purported teaching of *Shirakawa* to arrive at Applicant’s Claim 12 (Final Office Action, pages 7 and 8). Applicant respectfully disagrees. In the Final Office Action, the Examiner appears to rely on the current sensing resistors R74 and R75 of *Shirakawa* (Final Office Action, page 6 (referring to column 5, lines 17-25, of *Shirakawa*)). *Shirakawa* recites:

When the incoming current exceeds 781 mA, the control circuit 73 senses the excessive charge current and stops charging. In the constant current charging, current is limited when the voltage across the current sensing resistor R74 in the low-power path reaches 62.0 mV. The control circuit 73 also limits the current and stops charging when the voltage across the current sensing resistor R75 in the high-power path reaches 97.5 mV.

(*Shirakawa*, column 7, lines 43-51). Thus, in *Shirakawa* the voltages across the current sensing resistors R74 and R75 of *Shirakawa* are not compared. Instead, the current sensing resistors R74 and R75 of *Shirakawa* appear to be used independently of each other for two different purposes (e.g., to limit current in either a low-power path or a high-power path). In the Final Office Action, the Examiner states that the protection circuit of *Shirakawa* “compares the voltage potential across its two terminals” (Final

Office Action, page 6 (referring to lines 58-62 of an unidentified column of the *Shirakawa* reference)). Without addressing the accuracy of the Examiner's statement that *Shirakawa* "compares the voltage potential across its two terminals," the Examiner's statement appears to have no relevance to the relied on current sensing resistors R74 and R75 of *Shirakawa*. Clearly, the Examiner is using hindsight reconstruction to piece together purported teachings of the cited references to arrive at Applicant's claimed invention, which is improper. Moreover, even if the purported teaching of the cited references are combined, the resulting combination still does not disclose, teach or suggest the limitations of Claim 12. Accordingly, for at least these reasons also, Applicant respectfully submits that Claim 12 is patentable over the cited references.

10. Ninth Ground of Rejection (Claims 16, 24 and 25)

Claims 16, 24 and 25 was rejected under 35 U.S.C. §103(a) as being unpatentable over *Shirakawa* in view of *Fujiwara*. Claims 16, 24 and 25 depend from independent Claim 15. For at least the reasons discussed above, independent Claim 15 is patentable over the *Shirakawa* reference. For example, *Shirakawa* does not disclose or even suggest "a battery core pack coupled to electronic components forming the battery pack" and "an integrated circuit adapted to compare potentials across at least two different current sensors to detect an excessive current consumption condition associated with the electronic components" as recited by Claim 15 (emphasis added). Moreover, as discussed above with respect to Claim 12, *Shirakawa* does not disclose or even suggest "compar[ing] potentials across at least two different current sensors" as recited by Claim 15. Further, *Fujiwara* does not appear to remedy, nor did the Examiner rely on *Fujiwara* to remedy, at least the deficiencies of *Shirakawa* discussed above. Therefore, for at least these reasons, Applicant respectfully submits that Claims 16, 24 and 25 are patentable over the cited references.

11. Tenth Ground of Rejection (Claims 17 and 18)

Claim 17 and 18 was rejected under 35 U.S.C. § 103(a) as being unpatentable over *Shirakawa* in view of *Demuro*. Claims 17 and 18 depend from independent Claim

15. For at least the reasons discussed above, independent Claim 15 is patentable over the *Shirakawa* reference. For example, *Shirakawa* does not disclose or even suggest “a battery core pack coupled to electronic components forming the battery pack” and “an integrated circuit adapted to compare potentials across at least two different current sensors to detect an excessive current consumption condition associated with the electronic components” as recited by Claim 15 (emphasis added). Moreover, as discussed above with respect to Claim 12, *Shirakawa* does not disclose or even suggest “compar[ing] potentials across at least two different current sensors” as recited by Claim 15. Further, *Demuro* does not appear to remedy, nor did the Examiner rely on *Demuro* to remedy, at least the deficiencies of *Shirakawa* discussed above. Therefore, for at least these reasons, Applicant respectfully submits that Claims 17 and 18 are patentable over the cited references.

12. Eleventh Ground of Rejection (Claims 19, 20, 22, 33 and 38)

Claim 19, 20, 22, 33 and 38 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Shirakawa* and *Fujiwara* in view of *Huelss*. Claims 19, 20, 22, 33 and 38 depend respectively from independent Claims 15 and 30. For at least the reasons discussed above, independent Claims 15 and 30 are patentable over the *Shirakawa* reference. For example, *Shirakawa* does not disclose or even suggest “a battery core pack coupled to electronic components forming the battery pack” and “an integrated circuit adapted to compare potentials across at least two different current sensors to detect an excessive current consumption condition associated with the electronic components” as recited by Claim 15 (emphasis added), nor does *Shirakawa* disclose or even suggest “a protection circuit adapted to distinguish between current consumption associated with electronic components coupled to the battery core pack and forming the battery pack and current flow associated with the host device to determine whether an excessive current consumption condition exists associated with the electronic components of the battery pack” as recited by Claim 30 (emphasis added). Further, neither *Fujiwara* nor *Huelss* appears to remedy, nor did the Examiner rely on either *Fujiwara* or *Huelss* to remedy, at least the deficiencies of *Shirakawa* discussed above. Therefore, for at least these reasons,

Applicant respectfully submits that Claims 19, 20, 22, 33 and 38 are patentable over the cited references.

13. Twelfth Ground of Rejection (Claims 21, 23 and 34)

Claims 21, 23 and 34 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Shirakawa* and *Fujiwara* in view of *Okada*. Claims 21, 23 and 34 depend respectively from independent Claims 15 and 30. For at least the reasons discussed above, independent Claims 15 and 30 are patentable over the *Shirakawa* reference. For example, *Shirakawa* does not disclose or even suggest “a battery core pack coupled to electronic components forming the battery pack” and “an integrated circuit adapted to compare potentials across at least two different current sensors to detect an excessive current consumption condition associated with the electronic components” as recited by Claim 15 (emphasis added), nor does *Shirakawa* disclose or even suggest “a protection circuit adapted to distinguish between current consumption associated with electronic components coupled to the battery core pack and forming the battery pack and current flow associated with the host device to determine whether an excessive current consumption condition exists associated with the electronic components of the battery pack” as recited by Claim 30 (emphasis added). Further, neither *Fujiwara* nor *Okada* appears to remedy, nor did the Examiner rely on either *Fujiwara* or *Okada* to remedy, at least the deficiencies of *Shirakawa* discussed above. Therefore, for at least these reasons, Applicant respectfully submits that Claims 21, 23 and 34 are patentable over the cited references.

14. Thirteenth Ground of Rejection (Claims 26, 28, 29, 35 and 37)

Claims 26, 28, 29, 35 and 37 was rejected under 35 U.S.C. §103(a) as being unpatentable over *Shirakawa* and *Fujiwara* in view of *Cheon*. Claims 26, 28, 29, 35 and 37 depend respectively from independent Claims 15 and 30. For at least the reasons discussed above, independent Claims 15 and 30 are patentable over the *Shirakawa* reference. For example, *Shirakawa* does not disclose or even suggest “a battery core pack coupled to electronic components forming the battery pack” and “an integrated

circuit adapted to compare potentials across at least two different current sensors to detect an excessive current consumption condition associated with the electronic components” as recited by Claim 15 (emphasis added), nor does *Shirakawa* disclose or even suggest “a protection circuit adapted to distinguish between current consumption associated with electronic components coupled to the battery core pack and forming the battery pack and current flow associated with the host device to determine whether an excessive current consumption condition exists associated with the electronic components of the battery pack” as recited by Claim 30 (emphasis added). Further, neither *Fujiwara* nor *Cheon* appears to remedy, nor did the Examiner rely on either *Fujiwara* or *Cheon* to remedy, at least the deficiencies of *Shirakawa* discussed above. Therefore, for at least these reasons, Applicant respectfully submits that Claims 26, 28, 29, 35 and 37 are patentable over the cited references.

15. Fourteenth Ground of Rejection (Claims 27 and 36)

Claims 27 and 36 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Shirakawa* and *Fujiwara* in view of *Saeki*. Claims 27 and 36 depend respectively from independent Claims 15 and 30. For at least the reasons discussed above, independent Claims 15 and 30 are patentable over the *Shirakawa* reference. For example, *Shirakawa* does not disclose or even suggest “a battery core pack coupled to electronic components forming the battery pack” and “an integrated circuit adapted to compare potentials across at least two different current sensors to detect an excessive current consumption condition associated with the electronic components” as recited by Claim 15 (emphasis added), nor does *Shirakawa* disclose or even suggest “a protection circuit adapted to distinguish between current consumption associated with electronic components coupled to the battery core pack and forming the battery pack and current flow associated with the host device to determine whether an excessive current consumption condition exists associated with the electronic components of the battery pack” as recited by Claim 30 (emphasis added). Further, neither *Fujiwara* nor *Saeki* appears to remedy, nor did the Examiner rely on either *Fujiwara* or *Saeki* to remedy, at least the deficiencies of *Shirakawa* discussed above. Therefore, for at least these reasons,

Applicant respectfully submits that Claims 27 and 36 are patentable over the cited references.

16. Fifteenth Ground of Rejection (Claim 32)

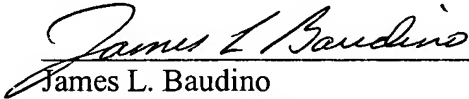
Claim 32 was rejected under 35 U.S.C. §103(a) as being unpatentable over *Fujiwara* in view of *Shirakawa*. Claim 32 depends from independent Claim 30. For at least the reasons discussed above, independent Claim 30 is patentable over the *Fujiwara* reference. For example, *Fujiwara* does not disclose or even suggest “a protection circuit adapted to distinguish between current consumption associated with electronic components coupled to the battery core pack and forming the battery pack and current flow associated with the host device to determine whether an excessive current consumption condition exists associated with the electronic components of the battery pack” as recited by Claim 30 (emphasis added). Further, *Shirakawa* does not appear to remedy, nor did the Examiner rely on *Shirakawa* to remedy, at least the deficiencies of *Fujiwara* discussed above. Therefore, for at least these reasons, Applicant respectfully submits that Claim 32 is patentable over the cited references.

CONCLUSION

Applicant has demonstrated that the present invention as claimed is clearly distinguishable over the art cited of record. Therefore, Applicant respectfully requests the Board of Patent Appeals and Interferences to reverse the final rejection of the Examiner and instruct the Examiner to issue a notice of allowance of all claims.

The Commissioner is authorized to charge the statutory fee of \$500.00 to Deposit Account No. 08-2025 of Hewlett-Packard Company. Although no other fee is believed due, the Commissioner is hereby authorized to charge any fees or credit any overpayments to Deposit Account No. 08-2025 of Hewlett-Packard Company.

Respectfully submitted,


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CLAIMS APPENDIX

1. A battery pack, comprising:
a protection circuit adapted to detect an excessive current consumption condition associated with electronic components forming the battery pack.
2. The battery pack of Claim 1, wherein the protection circuit is adapted to interrupt current flow to the electronic components forming the battery pack in response to detecting the excessive current consumption condition.
3. The battery pack of Claim 1, wherein the protection circuit is adapted to compare a voltage potential across at least two different current sensors to detect the excessive current consumption condition.
4. The battery pack of Claim 1, wherein the protection circuit is adapted to interrupt current flowing from a host device to the electronic components.
5. The battery pack of Claim 1, wherein the protection circuit is adapted to interrupt current flowing from a battery core pack to the electronic components.
6. The battery pack of Claim 1, further comprising at least one fuse serially connected to a battery core pack for interrupting current flowing from the battery core pack to the electronic components.
7. The battery pack of Claim 1, further comprising at least one fuse serially connected to a host device for interrupting current flowing from the host device to the electronic components.
8. The battery pack of Claim 1, wherein the protection circuit comprises a fuel gauge integrated circuit adapted to determine a combined current flow associated with a host device and the electronic components forming the battery pack.

9. The battery pack of Claim 1, wherein the protection circuit comprises a protection integrated circuit adapted to determine a current flow associated with the host device.

10. A battery pack, comprising:
at least one battery cell means coupled to electronic components forming the battery pack; and
means for detecting an excessive current consumption condition associated with the electronic components.

11. The battery pack of Claim 10, further comprising means for interrupting current flowing to the electronic components forming the battery pack in response to detecting the excessive current consumption condition.

12. The battery pack of Claim 10, further comprising means for comparing a voltage potential across at least two different current sensors to detect the excessive current consumption condition.

13. The battery pack of Claim 10, further comprising means for interrupting current flowing from a host device to the electronic components in response to detecting the excessive current consumption condition.

14. The battery pack of Claim 10, further comprising means for interrupting current flowing from the at least one battery cell means to the electronic components in response to detecting the excessive current consumption condition.

15. A battery pack, comprising:
a battery core pack coupled to electronic components forming the battery pack;
and
an integrated circuit adapted to compare potentials across at least two different current sensors to detect an excessive current consumption condition associated with the electronic components.

16. The battery pack of Claim 15, wherein the integrated circuit is adapted to interrupt current flowing to the electronic components forming the battery pack in response to detecting the excessive current consumption condition.

17. The battery pack of Claim 15, further comprising a fuse serially connected to a positive terminal of the battery core pack for interrupting current flowing from the battery core pack to the electronic components in response to detecting the excessive current consumption condition.

18. The battery pack of Claim 15, further comprising a fuse serially connected to a positive terminal of the battery core pack for interrupting current flowing from a host device coupled to the battery pack to the electronic components in response to detecting the excessive current consumption condition.

19. The battery pack of Claim 15, wherein at least one of the current sensors comprises a current sense resistor.

20. The battery pack of Claim 19, wherein the current sense resistor is serially connected between a positive terminal of the battery pack and a recharge transistor of the battery pack.

21. The battery pack of Claim 19, wherein the current sense resistor is serially connected between a negative terminal of the battery pack and a negative terminal of the battery core pack.

22. The battery pack of Claim 15, wherein at least one of the current sensors is connected in series between a positive terminal of the battery pack and a positive terminal of the battery core pack.

23. The battery pack of Claim 15, wherein at least one of the current sensors is connected in series between a negative terminal of the battery pack and a negative terminal of the battery core pack.

24. The battery pack of Claim 15, wherein the integrated circuit is adapted to distinguish between current flow associated with a host device and current consumption associated with the electronic components forming the battery pack based on the potentials across the at least two current sensors.

25. The battery pack of Claim 15, wherein the integrated circuit is adapted to determine current flow associated with a host device based on a potential across one of the at least two current sensors.

26. The battery pack of Claim 15, further comprising a fuse serially connected between a positive terminal of the battery pack and a recharge transistor for interrupting current flowing from a host device to the electronic components.

27. The battery pack of Claim 15, further comprising a fuse serially connected between a positive terminal of the battery core pack and a charge transistor for interrupting current flowing from the battery core pack to the electronic components.

28. The battery pack of Claim 15, wherein the integrated circuit is coupled to a fuse for interrupting current flowing from a host device to the electronic components in response to detecting the excessive current consumption condition.

29. The battery pack of Claim 15, wherein the integrated circuit is coupled to a fuse for interrupting current flowing from the battery core pack to the electronic components in response to detecting the excessive current consumption condition.

30. A battery pack, comprising:

a battery core pack connected to a positive terminal of the battery pack and a negative terminal of the battery pack, the positive and negative terminals adapted to be connected to a host device; and

a protection circuit adapted to distinguish between current consumption associated with electronic components coupled to the battery core pack and forming the battery pack and current flow associated with the host device to determine whether an excessive current consumption condition exists associated with the electronic components of the battery pack.

31. The battery pack of Claim 30, wherein the protection circuit is adapted to interrupt current flowing to the electronic components of the battery pack in response to detecting the excessive current consumption condition.

32. The battery pack of Claim 30, wherein the protection circuit comprises at least one integrated circuit adapted to compare voltage potentials across at least two different current sense resistors to detect the excessive current consumption condition.

33. The battery pack of Claim 30, wherein the protection circuit comprises a current sensor serially connected between the positive terminal of the battery pack and a positive terminal of the battery core pack.

34. The battery pack of Claim 30, wherein the protection circuit comprises a current sensor serially connected between the negative terminal of the battery pack and a negative terminal of the battery core pack.

35. The battery pack of Claim 30, wherein the protection circuit comprises at least one fuse for interrupting current flowing to the electronic components forming the battery pack in response to detecting the excessive current consumption condition.

36. The battery pack of Claim 30, wherein the protection circuit comprises a fuse for interrupting current flowing from the battery core pack to the electronic components in response to detecting the excessive current consumption condition.

37. The battery pack of Claim 30, wherein the protection circuit comprises a fuse for interrupting current flowing from the host device to the electronic components in response to detecting the excessive current consumption condition.

38. The battery pack of Claim 30, wherein the protection circuit comprises a current sensor serially connected between the positive terminal of the battery pack and a recharge transistor for determining the current flow associated with the host device.

EVIDENCE APPENDIX

None

RELATED PROCEEDINGS APPENDIX

None